

REVIEW

Awareness, knowledge, risk perception, and attitude of Mpox infection among community members in Sierra Leone

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Background: Community awareness, knowledge, and attitudes toward health-related concerns strongly influence public health outcomes in Sierra Leone. During the Ebola outbreak (2014–2016), misinformation and lack of understanding worsened the crisis, and similar challenges have been seen with COVID-19 and Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS). With Mpox cases rising in neighboring countries and increased human–animal interactions, community knowledge is crucial for prevention and outbreak control.

Objective: This study aimed to assess the knowledge, perception, and attitudes of the general public toward Mpox infection in Sierra Leone.

Materials and Methods: A cross-sectional design integrating quantitative and qualitative methods was used. Data were collected from 540 participants across five districts. Quantitative data were analyzed using Statistical Pack-age for the Social Science (SPSS) version 20, with binary logistic regression applied to test associations, while qualitative data underwent thematic analysis.

Results: Among the respondents, 74.6% were aware of Mpox, though only 35% correctly identified its transmission routes. About 80% reported health agencies as their primary source of information. Awareness and positive attitudes were higher among younger adults and males compared to older participants and females. Higher education and healthcare training were associated with better knowledge levels. Qualitative findings revealed persistent confusion about symptoms and highlighted stigma, fear, and misinformation, particularly among rural populations, sex workers, and youth, which hindered open discussion.

Conclusion: The findings highlight the importance of inclusive, community-driven awareness strategies. Engaging religious leaders, chiefs, and elders in sensitization efforts is essential to counter misinformation, reduce stigma, and enhance Mpox prevention in Sierra Leone.

Keywords: Attitude, awareness, diseases, risk perception, Mpox

Introduction

Amidst the devastation of the Coronavirus (COVID-19) pandemic, the unexpected return of the Monkeypox (Mpox) outbreak has heightened fears of the potential for another worldwide outbreak. Over 110 countries and territories have documented the global spread of Mpox, affecting individuals without proven travel ties to historically endemic areas (1). Mpox cases surged swiftly, resulting in its declaration as a public health emergency of international concern (PHEIC) on 13 August 2024 by the Africa Centers for Disease Control (Africa CDC). As of January 27, 2023, there were 85,142 laboratory-confirmed cases of Mpox worldwide, resulting in 86 deaths. The African CDC report on Mpox indicates that from May 2022 to July 28, 2024, there have been 37,583 cases and 11,451 deaths reported throughout 15 African Union member states (2). As of epidemiological week 33, the Economic Community of West African States (ECOWAS) area has reported a total of 44 confirmed cases and one fatality since the beginning of the year: Nigeria (24), Côte d'Ivoire (11), Liberia (5), and Ghana (4). Nonetheless, the underreporting of Mpox infections and associated diseases poses a significant issue in Africa, particularly in rural regions. This issue was attributed to inadequate medical facilities, self-medication practices, and an inadequate disease-reporting culture (2). Community awareness, knowledge, and attitudes toward health-related concerns have significantly influenced public health outcomes in Sierra Leone. Misinformation and a lack of understanding regarding the virus significantly worsened the Ebola outbreak from 2014 to 2016. Similar challenges in addressing other associated health issues like COVID-19 and Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) were observed (3). The rise in cases in neighboring countries, along with increased human-animal interactions, underscores the necessity for community members to be aware and have knowledge regarding Mpox infections, which is crucial for implementing preventive measures and mitigating contagion during an outbreak.

Prior research on Mpox infection knowledge and perceptions has mainly employed quantitative analysis methods, restricting engagement with other demographic groups such as children (ages 12–17), farmers, traditional healers, and religious leaders. Several quantitative studies were carried out via online surveys on social media sites, where people may refrain from participating due to age restrictions and limited internet availability in remote regions. To the best of the authors' knowledge, this is the first study to adopt both strategies. Also, there is limited evidence of in-person surveys on Mpox infection among community members in Sierra Leone. There are also no studies comparing Mpox knowledge and risk perception across different districts/regions in Sierra Leone. Therefore, the research questions guiding this study were: (1) What

is the level of awareness, knowledge, risk perception, and attitudes regarding Mpox infection among community members in Sierra Leone? (2) How do these measures vary by demographic factors such as age, gender, and education? (3) What are the primary sources of Mpox information and barriers to accurate knowledge in these communities?

Methodology

Study design

The cross-sectional study employed a combination of quantitative and qualitative methods to gather data from participants across five districts in Sierra Leone: Western Area Urban and Rural (western geopolitical zone), Kambia (northwestern geopolitical zone), Pujehun (southern geopolitical zone), and Kailahun (eastern geopolitical zone). The qualitative study concentrates on focus group discussion (FGD), aiming to engage eight groups to evaluate their awareness, knowledge, perception, and attitude regarding Mpox.

Research population

The study examined the entire community to collect both quantitative and qualitative data. However, the qualitative data focused on distinct groups within each district, such as children aged 12–17, farmers, traditional healers, religious leaders, health workers, sex workers, pregnant women, and youth. Nine hundred and forty participants (940) were recruited in all five districts: 620 for the quantitative data study and 320 for the FGD. Individuals from the five sampled districts comprised the research group.

Sampling and sample size

For the quantitative aspect, the study employed a convenience sampling method to select community members. Participants were required to be at least 18 years old and capable of communicating in English or the primary native languages spoken in the selected district. The sample size was determined using the appropriate statistical formula. The statistical formula was derived from a study done by (4, 5).

$$n = Z^2 pq/d^2$$

Where:

Z = the z -score for the desired confidence level (1.96 for 95% confidence)

p = estimated proportion of the population with the attribute of interest (0.5)

$$q = 1 - p (0.5)$$

d = margin of error, set at 0.05

Then $n = 384$.

Increasing the sample size beyond the calculated requirement (384–620) enhances the precision of the estimates and increases the statistical power of the study.

For the qualitative aspect, the selection of respondents was done using a purposive sampling method. A total of 64 participants, from each district, were recruited to participate in a FGD.

Data collection

Before data collection, the questionnaire and FGD guide were piloted for field testing. After the field test, trained individuals with at least a secondary education and proficiency in the local dialects of the respective districts were recruited to conduct both FGDs and interviewer-administered surveys. Data collectors were exposed to a comprehensive 2-day training program. Following this, a 1-day pretest study was conducted. For the quantitative aspect, data were collected on Android tablets using the Community Listening App. For each chosen community in every district, a specific data collector was designated to reduce duplication, and respondents were asked if they had been contacted for the study during the designated time frame. The data collection period was from September 27, 2024, to October 1, 2024. After the period of data collection had elapsed, 620 participants were retrieved for the quantitative data analysis.

The qualitative aspect conducted between September 25, 2024, and October 1, 2024, employed FGD to provide respondents with the opportunity to articulate their understanding of Mpox. A FGD guide developed for this study comprises the study details, consent protocols, and a demographic sheet for participants. The guide included open-ended questions and probes regarding awareness, knowledge, perceptions, and attitudes toward Mpox. The guide was developed in English, collaborating with data collectors to establish translations of essential phrases in all primary local languages, which were recorded during the training sessions. The FGDs were done in English, Krio, Temne, or Mende, according to the respondents' preferred local language. Comprehensive responses were gathered during the discussion to enhance the study. The data collectors took notes in English and recorded, translated, and transcribed the interviews. In each district, eight FGDs were conducted; the first three were with children, youth, and farmers; another was with sex workers, pregnant women, and religious leaders; and a third FGD was with traditional healers and health workers. The total number of people in each FGD was eight. Each FGD was conducted at the district headquarters town. The eight groups were recruited by reaching out to the District Health Management Team (DHMT) coordinator in each district.

Data analysis

An Excel sheet was automatically generated from the online questionnaire, enabling further statistical analysis. The statistical analysis was carried out using Statistical Package for the Social Science (SPSS), and variable sets were created while inputting the data. Before data analysis, the data were examined for missing data and errors. An analysis to check for outliers was conducted, and descriptive statistics such as mean, standard deviation, frequency, and percentages were used for descriptive analysis. A validity test was carried out, and factors were extracted using principal component analysis and varimax rotation. Factor analysis is widely regarded as one of the most effective techniques for establishing construct validity (6). A reliability test was conducted on valid items to generate a Cronbach's alpha value. A rule of thumb is that a coefficient =0.6 is considered acceptable (7). To test the association between the respondent's sociodemographic characteristics and the dependent variable (awareness), logistic regression was performed.

All FGDs were audio-recorded to ensure the accuracy and completeness of the collected information, and supplementary notes were taken to capture immediate insights and contextual details. The audio recordings from the FGDs were listened to and directly translated into English transcripts. These transcriptions were then cross-referenced with the written notes to ensure the accuracy and completeness of the data. Responses were coded and analyzed using thematic content analysis.

Inclusion criteria

Community members from the five selected districts (Western Area Urban, Western Area Rural, Kambia, Pujehun, and Kailahun).

- For the quantitative survey:

- Individuals 18 years and above.
- Able to communicate in English or the primary native languages of the district.

- For the qualitative study (FGDs):

- Selected groups such as children aged 12–17, farmers, traditional healers, religious leaders, health workers, sex workers, pregnant women, and youth.

Exclusion criteria

- Individuals below 18 years were excluded from the quantitative study.

- Individuals who could not communicate in English or the main local dialects were excluded.
- Community members outside the five sampled districts were not included in either the quantitative or qualitative study.

Results

Quantitative analysis

Socio-demographic characteristics of respondents

A total of 620 community members were recruited in all five districts, but only 540 provided valid responses, resulting in a response rate of 87.1%. Most of the respondents were between 28 and 37 years old (31.8%). Most respondents were married (58.3%). Many of the participants had completed their education up to the tertiary level (34.7%). Business owners made up a significant proportion

TABLE 1 | Socio-demographic characteristics of respondents.

Variables	Frequency	Percentage (%)
Age groups (in years)		
18–27	160	29.6
28–37	172	31.8
38–47	111	20.6
48–57	64	11.9
≥58	33	6.1
Gender		
Male	279	51.7
Female	261	48.3
Marital status		
Single	225	41.7
Married	277	51.3
Divorced	38	7.0
Educational level		
None educated	124	23.0
Primary	43	8.0
Secondary	185	34.3
Tertiary/higher	188	34.7
Religion		
Christian	210	38.9
Muslim	330	61.1
Occupation		
Business owner	164	30.4
Farmers/manual laborers	105	19.4
Health worker/one health	73	13.5
Local authority	37	6.6
Others (accountants, motorcycle taxi drivers, and students)	161	29.8

TABLE 2 | Awareness/knowledge of Mpox among community members across the five districts.

Variables	Frequency	Percentage (%)
Variable-awareness of Mpox		
Have you heard of Monkeypox, or Mpox, before		
Yes	403	74.6
No	137	25.4
How did you hear of Monkeypox or Mpox		
Radio	126	23.3
Word of mouth	135	25.0
WhatsApp	114	21.1
Facebook	91	16.9
TikTok	23	4.3
Community leaders	41	7.6
Others (mosque, workplace, health worker)	10	1.8
Variable-knowledge of signs and symptoms		
What are the signs and symptoms of Mpox		
Rashes	216	40.0
Fever, headache, muscle aches	190	35.2
Vomiting	30	5.6
Thick coating at the back of the throat	18	3.3
Diarrhoea	27	5.0
Back pains	21	3.9
Swollen lymph nodes/glands	28	5.2
Others (joint pain, red eyes, running nose, body pain, etc.)	10	1.8
Variable-knowledge of transmission		
Mpox can be transmitted through the following		
Direct contact with an infected person's rash or sores	189	35.0
Contact with contaminated objects, fabrics, or surfaces	101	18.7
Respiratory droplets from an infected person	83	15.4
Animal bites or scratches	98	18.1
Consuming contaminated food or water	40	7.4
I don't know	29	5.4
Variable-knowledge on prevention		
Which of the following can help prevent the spread of Mpox		
Cleaning your surroundings regularly	86	15.9
Washing hands with soap and water	180	33.3
By drinking safe water	32	5.9
Cooking food thoroughly	35	6.5
Covering food to keep away flies	42	7.8
Avoiding skin-to-skin contact with people with Mpox symptoms	75	13.9
Praying for help	22	4.1
Following the healthcare workers' advice	19	3.5
Using honey and lemon	10	1.9
Getting Mpox vaccine	36	6.7
Other	3	0.5

of participants, accounting for 30.4%. This is revealed in **Table 1**.

Awareness/knowledge of Mpox among community members across the five districts

Overall, 74.6% (403/540) of community members were aware of the Mpox infection. Of the 403 participants who were aware of the Mpox infection, 25.0% heard about it through word of mouth, followed by radio (23.3%) and WhatsApp (21.1%). In terms of community knowledge of the signs and symptoms of Mpox infection, 80.2% of the participants were familiar with its signs and symptoms, which include rashes, fever, headaches, muscle aches, and swollen lymph nodes. Thirty-five percent (35.0%) of the respondents were aware that direct contact with an infected person's rash or sores can transmit the Mpox infection; 18.7% were aware that contact with contaminated objects can transmit it; and the least number, 5.4%, had no knowledge about its transmission. The majority of the respondents (56.8%) had knowledge on how to prevent the spread of Mpox infection, while a few among the respondents had no knowledge on how to prevent its spread (6.0%), respectively. This is shown in **Table 2**.

Risk perception of Mpox among community members across the five districts

When asked where Mpox originated, 363 (67.2%) respondents said it was a virus, 14.8% said it was a curse from God, and 6.1% and 11.3% said it was a fake disease or a disease specific to foreign nationals. Among 13.1% of those who do not believe, 42.3% of them said it was just for money-making, while 21.1% said it was fake news. Forty-two (42.0%) of the respondents expressed extreme concern about preventing Mpox infection, while 17.0% expressed no concern at all. Twenty-six (26.0%) and 18.7% of the respondents expressed their fear of feeling sick and facing stigma if they came into contact with Mpox. Most of the respondents said children and pregnant women were at risk of transmitting Mpox (24.8% and 20.7%, respectively), while 9.1% did not provide any answer to the question. This is seen in **Table 3**.

Attitude of Mpox among community members across the five districts

According to the data presented in **Table 4**, 21.9% of participants engaged in hand washing prior to eating, and 20.9% did so after using the toilet. Of the participants who indicated they would wash their hands, 50.0% reported that they would use soap and water, whereas 21.3% stated they would use only water. Twenty-four (24.0%) of the participants indicated that they would seek care at the health center if they or their families fell ill with Mpox. Meanwhile, 14.4% expressed a preference for self-medication

TABLE 3 | Risk perception of Mpox among community members across five districts.

Variables	Frequency	Percentage (%)
Where do you think Mpox came from		
It is a virus	363	67.2
A curse from God (adjust to context)	80	14.8
A fake disease created by health workers and the government	33	6.1
Foreign Nationals/White people	61	11.3
Other (I don't know)	3	0.6
Do you believe the Mpox outbreak (in other countries) is real		
Yes	469	86.9
No	71	13.1
If you do not believe the Mpox outbreak is real, why do you think people (organizations, media, and government) are talking about it?		
To make money	30	42.3
For political gains	11	15.5
To oppress certain groups/communities	5	7.0
To create fear	10	14.1
Fake news	15	21.1
How concerned are you about becoming infected and sick from Mpox?		
Not at all	92	17.0
Slightly concerned	80	14.8
Somewhat concerned	67	12.4
Moderately concerned	76	14.1
Extremely concerned	225	41.7
What do you think would be the impact of contracting Mpox?		
Feel sick	139	25.7
Unable to perform daily activities/work	64	11.9
Need to be hospitalized	54	10.0
Might die	85	15.7
Contaminate other members of the household	97	18.0
Be stigmatized in the community	101	18.7
Are the following groups most likely/at risk to transmit it?		
People living with immunodeficiency	48	8.9
People with chronic health conditions	84	15.6
Children	134	24.8
Pregnant women	112	20.7
Sex workers	93	17.2
I am not sure	20	3.7
No answer	49	9.1
Do you think Mpox can be prevented by following the recommended practices/measures?		

(Continued)

TABLE 3 | (Continued)

Variables	Frequency	Percentage (%)
Yes	471	87.2
No	69	12.8
How confident are you in your ability to implement prevention practices/measures in your household?		
Very confident	316	58.5
Somewhat confident	147	27.2
Not confident	77	14.3
Are those (promoted) prevention practices/measures easy/feasible to follow?		
Yes	448	83.0
No	92	17.0

through traditional methods, and 14.1% would turn to religious healers. Additionally, 12.8% and 11.7% mentioned they would opt for conventional medicine or visit drug peddlers, respectively, should they or their family members become ill with Mpox. The remaining 0.9% did not provide a response to the question. In total, 80.2% (433 out of 540) of the community members indicated that they would seek care at the health center if they experienced any signs or symptoms of Mpox. Conversely, a small proportion (6.5%) of participants expressed uncertainty regarding the appropriate actions to take if they exhibited any of the signs.

Reliability and validity analysis

Findings presented in **Table 5** show the validity of the measurement items ranging from 0.575 to 0.975. For a factor loading to be significant, the authors set a practical cut-off criterion of 0.5 (8). Extraction values below 0.5 were therefore removed. Analysis and internal consistency were repeated in each case for the available items until the recommended thresholds were obtained. This led to a reduction of the 9 items for risk perception to an 8-item construct and a reduction of the 4 items for attitude to 3 items. Awareness and knowledge maintained the initial values. As regards internal consistency, the reliability values obtained were above the threshold suggested by (7).

The logistic regression analysis in **Table 6** revealed that educational status was the strongest predictor of Mpox awareness, with educated individuals being 6.75 times more likely to be aware of Mpox compared to those with no education (AOR = 6.75, 95% CI: 3.76–12.11, $p < 0.001$). Occupation had a major effect, as health workers and business owners had significantly lower odds of awareness (AOR = 0.09

TABLE 4 | Attitudes of Mpox among community members across five districts.

Variables	Frequency	Percentage (%)
Variable-hygiene practices		
During which activities do you usually wash your hands?		
After using the toilet	113	20.9
Before preparing food	75	13.9
Before eating	82	15.2
After eating	118	21.9
After feeding and watering animals	15	2.8
After touching surfaces, objects from another person	38	7.0
After shaking hands or having physical contact with another person	25	4.6
After taking care/being in contact with a sick person	65	12.0
Other	9	1.7
With what do you wash your hands?		
Soap and water	270	50.0
Water only	115	21.3
Chlorinated water	90	16.7
Ash	40	7.4
Sand	16	3.0
No answer	3	0.5
Other	6	1.1
Variable-health seeking behaviors		
If you or someone in your family falls sick with Mpox symptoms, what do you do?		
Self-medication using traditional methods	78	14.4
Self-medication using conventional drugs	69	12.8
Go to a health center	129	23.9
Do not treat/Wait till it goes away	11	2.0
Go to a traditional healer	46	8.5
Go to a religious healer	20	3.7
Go to a pharmacy	79	14.1
Drug peddlers/street	25	4.6
Call 117	63	11.7
I don't know	8	1.5
No answer	5	0.9
Other, specify	7	1.3
If you get any of the Mpox symptoms, would you go to a health center?		
Yes	433	80.2
No	63	11.6
No answer	9	1.7
I don't know	35	6.5

and 0.21, respectively, $p < 0.001$), suggesting potential gaps in information dissemination within these groups. In contrast, age, marital status, and religion

did not show statistically significant associations with Mpox awareness.

Qualitative report on focus group discussions (FGDs) on Mpox awareness, knowledge, and attitudes in Sierra Leone

Information access/awareness of Mpox among various groups

Health workers demonstrated a relatively high level of awareness about Mpox. They understood that it is a zoonotic disease, with transmission both from animals to humans and from humans to humans. Their primary sources of information were formal channels such as radio and community health posts. The youth showed awareness of Mpox, but there was skepticism about its similarities to Ebola or COVID-19. They obtained information mainly from social media and informal settings, such as ataya bases (youth congregation centers). Sex workers were generally aware of Mpox, though their understanding was largely based on health workers' communications and news outlets. They often confused Mpox with older diseases such as chickenpox, while pregnant women had limited knowledge and access to information about Mpox, indicating a critical gap in their exposure to health information on this disease. Farmers reported minimal awareness and were unsure if Mpox was a new disease or a renamed version of an old one. Religious leaders had mixed awareness, with some referring to Mpox as a "fire bump" and associating it with boils or sores. As narrated: "I heard it is a sickness originated from a monkey" (P2, religious leader, female).

Knowledge of signs, symptoms, and transmission of Mpox among various groups

Health workers had a good grasp of the symptoms of Mpox, including rashes, fever, and headaches. They were also able to distinguish between Mpox, chickenpox, and measles. However, youths shared some of the same knowledge, but many lacked clarity on the specific signs and symptoms of Mpox, often confusing it with other infectious diseases. Both groups recognized basic symptoms such as fever and rashes but lacked detailed knowledge about other less obvious signs and the complexities of transmission.

Farmers linked Mpox transmission to close contact and shared personal items like soap and clothes. While religious leaders connected transmission to bodily contact and suggested social distancing as a preventive measure. Youths identified direct body contact and unprotected sex as key transmission routes; pregnant women were concerned about sexual transmission and contact with monkeys, while stakeholders showed a mix of knowledge, with some mentioning transmission through blood. As narrated: "The sick can be transferred through blood transfusion with an infected person" (P5, stakeholder, male).

Attitudes of various groups towards Mpox

Several health workers acknowledged the existence of fear associated with Mpox, but most of them considered the disease significant. Nonetheless, certain individuals within the community downplayed its significance, perceiving it as fabricated or overstated. The younger demographic often dismissed the disease as a mere joke or a conspiracy to undermine traditional customs such as the consumption of bush meat (monkeys). Individuals involved in sex work expressed fear about the stigma associated with the disease and chose to avoid discussing Mpox due to potential discrimination. Pregnant women expressed reluctance to discuss the disease, restricting feelings of uncertainty and unwillingness regarding potential social exclusion. Farmers expressed concerns about potential stigmatization and showed hesitation when discussing the disease publicly. Religious leaders expressed their concerns regarding stigmatization, emphasizing the need for community leaders to take the initiative and promote prevention efforts. As narrated: "They don't want us to eat monkey/bush meat, because this disease had existed before" (P6, youth, male). Another respondent narrated: "This is an old disease with a new name; they just want to stop us from eating monkey" (P8, youth, male).

Perception of various groups towards community engagement and trust

Youth viewed healthcare professionals, community leaders, and religious figures as reliable sources of information. Those engaged in sex work and pregnant women depended on healthcare providers and community leaders as essential channels for sharing information. Farmers exhibited minimal involvement in community-driven prevention initiatives, while religious leaders urged greater participation from community chiefs, and elders. As narrated: "We trust our nurses, chiefs and religious leaders; whatever they told us we will believe them" (P2, pregnant women).

Attitude regarding health-seeking behavior

Health workers and youth indicated that they would seek treatment at health centers if symptoms appeared. While both groups expressed a preference for health centers, some mentioned pharmacies for immediate care, which suggests potential delays in seeking professional treatment. Farmers and religious leaders expressed a general willingness to seek treatment at health centers, though some uncertainty existed about alternative healthcare options.

Vaccine acceptance among various groups

Most participants were unaware of the Mpox vaccine, with only a few expressing interest in receiving it if it were available.

Integrated findings. Quantitative surveys revealed moderate Mpox awareness but incomplete knowledge of

TABLE 5 | Reliability and validity analysis.

Variables	Indicators	Factor loadings	Cronbach's alpha
Awareness	AW1	0.975	0.981
	AW2	0.975	
Knowledge	KW1	0.772	0.845
	KW2	0.657	
	KW3	0.684	
Risk perception	RP1	0.685	0.849
	RP2	0.941	
	RP3	-	
	RP4	0.867	
	RP5	0.827	
	RP6	0.817	
	RP7	0.956	
	RP8	0.960	
	RP9	0.967	
Attitude	AT1	-	0.914
	AT2	0.805	
	AT3	0.575	
	AT4	0.715	

specific aspects. Only a minority of respondents correctly identified treatments and vaccine availability. Qualitative interviews echoed these gaps, with participants expressing uncertainty about symptoms and prevention. Both data sources indicated strong trust in official guidance. These integrated results highlight that while general Mpox

awareness exists, detailed knowledge remains lacking, even as confidence in healthcare guidance is high. Demographic analyses revealed significant differences in Mpox knowledge and attitudes. Younger participants tended to have higher knowledge scores than older adults. Men showed somewhat higher awareness and more positive attitudes than women, supporting reports that female individuals often have lower Mpox knowledge and that attitudes vary by gender and age. Educational and occupational background also influenced responses, as individuals with healthcare training or higher education demonstrated greater understanding; interviews reinforced these patterns as older or less-educated participants often downplayed Mpox risk while professionals spoke more confidently. These contrasts suggest public health campaigns should be tailored by providing accessible, targeted information to older adults, women, and non-health professionals.

Discussion

The study examined awareness, knowledge, risk perceptions, and attitudes toward Mpox infection in five districts. Although there have been few national reports that have investigated Mpox knowledge and attitudes among this specific group (9), our findings contribute to a growing body of literature on public health preparedness in low-resource settings. Overall awareness of Mpox infection was notably high across the five districts, with 74.6% of respondents reporting familiarity with the disease. This

TABLE 6 | Unadjusted and multivariable logistic regression analysis of awareness of Mpox among community members in Sierra Leone.

Variables		Odd ratio	Unadjusted 95% CI	P-Value	Odd ratio	Adjusted 95% CI	P-value
Respondent's age	18–27 years	Ref			Ref		
	28–37 years	1.22	0.73–2.02	0.451	0.51	0.21–1.27	0.148
	38–47 years	0.81	0.46–1.43	0.468	0.43	0.18–1.02	0.060
	48–57 years	0.79	0.40–1.56	0.524	0.40	0.16–0.99	0.052
	58 years and above	0.65	0.27–1.57	0.342	0.50	0.19–1.31	0.155
Marital status	Single	Ref					
	Married	0.55	0.27–1.11	0.087	1.15	0.49–2.67	0.746
	Divorced	0.45	0.22–0.92	0.031	1.00	0.45–2.24	0.989
Educational status	None educated	Ref					
	Primary	5.14	3.03–8.73	0.000	6.75	3.76–12.1	0.000
	Secondary	1.66	0.74–3.74	0.217	2.12	0.91–4.92	0.082
	Tertiary/higher	1.42	0.83–2.42	0.188	1.64	0.93–2.18	0.090
Occupation	Business owner	Ref			Ref		
	Farming	0.52	0.31–0.85	0.014	0.36	0.21–0.63	0.000
	Health worker	1.22	0.73–2.04	0.445	0.64	0.35–1.14	0.13
	Local authority	0.09	0.03–2.82	0.000	0.09	0.03–0.32	0.000
	Others (accountant)	0.38	0.15–0.98	0.035	0.28	0.10–0.77	0.010
Religion	Christian	Ref					
	Muslim	0.29	0.96–2.11	0.07	1.43	0.93–2.18	0.101

reflects a commendable level of understanding within the community compared to findings from a similar study in Nigeria, where about one-third (38.3%) of community members were aware of mpox infection (5). Despite high general awareness, detailed knowledge remained incomplete, as only 35% of respondents correctly identified transmission routes. This rate is lower than the 42% transmission knowledge reported by Italian clinicians (10) and the 9.7% found in a multi-country study of healthcare personnel in Arabic regions (11) but higher (44.4%) among secondary school students in Saudi Arabia (12). Participants frequently identified radio and social media as their main sources of information, a finding that aligns with other research (13).

The study revealed significant demographic variations in Mpoxy knowledge and attitudes that inform targeted intervention strategies. Younger adults demonstrated higher awareness through social media engagement, yet showed concerning confusion between Mpoxy and other diseases and only low vaccine acceptance, showing their vulnerability to misinformation despite greater information exposure. In contrast, older adults (≥ 48 years) exhibited lower awareness, often attributing Mpoxy to supernatural causes and showing greater reliance on traditional healers, reflecting both knowledge gaps and healthcare system distrust. Gender disparities emerged, with men's slightly higher awareness undermined by risk dismissal tendencies, while women, particularly pregnant women, faced access barriers and stigma fears that could deter care-seeking. Educational attainment proved essential, with tertiary-educated individuals showing greater awareness than uneducated respondents. Occupation-specific challenges included farmers' knowledge deficits and sex workers' avoidance of discussion due to stigma. Geographic disparities were stark, with urban areas showing stronger awareness and trust compared to rural communities, where structural barriers and stigma narratives prevailed. Healthcare workers and religious leaders emerged as the most trusted information sources.

Consistent with results from studies carried out in Pakistan (14), KSA (11), the United States of America (15), and Italy (10). The general knowledge level of the participants was found to be satisfactory. The obtained result was expected, considering that there were no reported cases of Mpoxy in Sierra Leone. In addition, when comparing the results with reports from the Western world, it is important to consider variables such as the timing of the survey, sample size, and the socio-demographic characteristics of the participants, such as age, occupation, and religion (16). The study's focus on community members, including marginalized groups like sex workers and farmers, provides a more comprehensive understanding compared to studies limited to healthcare workers or urban populations (9, 11). The lessons learned from the COVID-19 pandemic highlight the importance of fully understanding every aspect of the

disease and implementing proactive strategies to prepare for the possibility of another surge.

The overall attitude of the participants regarding proper hygiene practices was considered adequate. The surveyors raised concerns about the practicality of managing disease control within the Sierra Leone population, citing the need for more Infection Prevention and Control (IPC) supplies as a significant barrier. While there are currently no cases of Mpoxy, participants expressed concern about the possibility of the disease spreading to Sierra Leone, given its reported presence in Guinea and Liberia. Uncertainties about the effectiveness of available vaccines and a general lack of comprehensive knowledge about the virus throughout the country contributed to more fear among the participants (14). The main concern highlighted by the majority of participants in the FGD is that Mpoxy can create an extra financial burden on the countries impacted (11). This economic anxiety reflects broader systemic vulnerabilities, as seen in other West African nations where outbreaks strained already fragile health systems (2). The findings indicate that just over half of the participants expressed that they were not intending to receive a vaccination for Mpoxy. This finding contradicts a study conducted in Indonesia, where over 90% of the general population expressed a willingness to accept a vaccine to prevent Mpoxy (15). This disparity may stem from differences in trust in health systems; the qualitative data revealed that vaccine hesitancy in Sierra Leone was often tied to mistrust of government initiatives.

The study offers important implications for the government of Sierra Leone and policymakers. The government and other public health agencies should launch community-based sensitization campaigns focused on clarifying the symptoms, transmission methods, and prevention strategies of Mpoxy. Religious leaders, chiefs, and community elders should be actively involved in spreading health messages. Their influence can help reduce stigma and encourage open dialogue about Mpoxy. Information should be distributed via multiple channels, including health centers, radio programs, and community events. There should be an implementation of communication strategies to reduce the stigma associated with Mpoxy, particularly in rural areas. Misconceptions should also be addressed, especially among groups who may trivialize the disease.

Although Sierra Leone demonstrates a foundational awareness of Mpoxy, critical gaps persist in detailed knowledge, risk perception, and preventive behaviors. These findings are in line with global trends but also reveal localized challenges such as stigma and resource limitations. Future interventions should engage trusted community figures and use culturally tailored messaging to address these gaps, building on insights from previous outbreaks and successful regional responses.

Limitations and future research

The present study is valuable in comprehending Mpox awareness, risk perception, and attitudes across diverse communities in Sierra Leone. However, several limitations should be acknowledged. First, the use of convenience sampling in five districts may not fully represent the entire demographic diversity, potentially limiting the generalizability of the findings. Second, reliance on self-reported data in both surveys and FGDs introduces the possibility of response biases, which could influence the accuracy of the reported knowledge and attitudes. Third, the cross-sectional design captures a single point in time, limiting the ability to assess changes in awareness and attitudes over time or to establish causal relationships. Fourth, although efforts were made to translate materials and conduct interviews in local languages, varying literacy levels and potential misunderstandings could have impacted participants' comprehension and responses. Fifth, while qualitative methods provided rich insights, time constraints and the breadth of topics covered may have limited the depth of exploration into certain themes, such as cultural beliefs influencing health behaviors.

Future research should aim to address these limitations. Employing probability-based sampling techniques such as stratified random sampling to ensure key subgroups (age, gender, education, region) are proportionally represented, cluster or multistage sampling to manage geographic dispersion would enhance the representativeness and generalizability of findings across Sierra Leone. Expanding the geographic scope to include a broader range of districts and communities would further strengthen external validity. Implementing longitudinal research designs would allow for the assessment of changes in Mpox awareness and attitudes over time, particularly in response to public health interventions. Combining quantitative surveys with in-depth qualitative methods, such as ethnographic studies, could provide a more comprehensive understanding of the cultural and contextual factors influencing Mpox-related behaviors. Research focusing on specific demographic groups identified as having lower awareness or higher susceptibility to misinformation can inform the development of tailored health education programs. Additionally, assessing the effectiveness of different health communication channels and messages in improving Mpox knowledge and preventive behaviors would be valuable for optimizing public health outreach.

Conclusion

There are notable gaps in understanding the transmission routes, symptoms, and preventive strategies related to Mpox. Critical barriers include misconceptions, stigma, and a lack of awareness regarding the Mpox vaccine. Fear and stigma

hinder open dialogue about the disease, especially in rural communities and among sex workers and young people.

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Ethical statement

Prioritizing ethical integrity throughout the research began with obtaining approval from the Sierra Leone Ethics Committee before beginning the research activity. All participants gave informed consent after providing a detailed explanation of the study's objective, potential risks and benefits, and the voluntary nature of participation. Only authorized study team members had access to securely stored data. After data collection, participants were offered a brief educational session on Mpox to recognize the educational opportunity the study presented and to ensure they benefited from their participation. This technique not only followed ethical research practices but also helped raise awareness about Mpox within the community.

Author contributions

AJ: Writing – original draft. LN: Writing – original draft. HT: Data curation, Writing – review and editing. PL: Data curation, Writing – review and editing. JS: Writing – review and editing. MJ: Writing – review and editing. FS: Supervision, Writing – review and editing. MV: Supervision, Writing – review and editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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